

MS4 NPDES Application

Attachment C

**CITY OF LANSING
STANDARD OPERATING
PROCEDURES**



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I. SOP SERIES 100. POLLUTION PREVENTION FOR FLEET MAINTENANCE AND STORAGE YARDS

Purpose of SOP Series 100

To protect storm water using proper refuse storage, collection, transport, and disposal techniques; proper vehicle washing techniques and washing locations; proper vehicle and equipment fueling techniques; and proper techniques for maintaining a clean and organized facility. To meet requirements for record keeping and inspection checklists.

Related Guidance

- USEPA National Menu of BMPs
- USEPA Storm water Phase II Final Rule Fact Sheet Series
- MDEQ Guidebook of BMPs:
 - Equipment Maintenance and Storage Areas
 - Spoil Piles
 - Storm Sewer Inlet Protection

Other Related SOPs

- Control of Solids and Contaminants from City's Paved Surfaces
- Managing Vegetated Properties

A. SOP 110. Vehicle and Equipment Storage and Maintenance

1. Procedures/Practices

Continuous

- Store chemicals, wastes, and vehicles inside whenever possible to minimize their potential to pollute storm water. If indoor storage is not possible, store on paved areas and use permanent or temporary covering.
- Perform vehicle/equipment maintenance in a single, designated covered facility (indoors if possible). If indoor activities are not possible, use drip pans and other containment devices to prevent spills while servicing vehicles.
- Material handling procedures outlined below need to address both inside and outside material handling activities. Materials spilled inside are frequently tracked outside by vehicles and foot traffic.
- Avoid storing hazardous materials in high-traffic areas.
- Store containers on pallets or equivalent structures.
- Move leaking vehicles or equipment indoors or under cover as soon as possible. If they cannot be moved indoors immediately, drain the leaking fluids and place a tag on the steering wheel to alert drivers of leaks.
- Avoid parking over storm drains.



Uncovered, outdoor material storage area



Sign to warn of hazardous chemical presence

- Use nontoxic or low toxicity materials.
- Clean all parts indoors at a centralized station, parts cleaner, or tub.
- Clean equipment prior to placing in storage. Equipment should be washed in an approved area where wash water will drain to the sanitary sewer.

- Perform all parts cleaning in a designated area to minimize the potential for spills.
- Use steam cleaning, pressure washing, or aqueous washers instead of solvents.
- Never use gasoline as a cleaner or solvent.
- Drain oil filters before disposal or recycling.
- Transfer fluids from drip pans to the appropriate waste containers as the first step in clean up after repair work is completed.
- Never dispose of spent cleaners down the floor drains without proper treatment, sinks, storm drain, on the ground or into the air.

Weekly

- Use absorbent material to clean up drips/leaks
- Regularly sweep parking lots to remove dirt/debris.
- Regularly pickup and dispose of waste materials and scrap equipment.
- Industrial materials should be stored in sealed, labeled containers that are stored on pallets or equivalent structures. Do not store materials directly on the ground.

Daily

- Inspect for leaks and the condition of equipment, drums, tanks, and containers and make sure industrial materials are properly stored and labeled.

2. Employee Training

Continuous

- Employee training at a minimum should include the following SWPPP components: preventative maintenance and good housekeeping practices, proper fueling procedures, material handling including spill prevention and response, internal spill and response procedures should be a component of the spill prevention and response plan.

At least once per year

- Frequent and proper training of employees reduces the potential that materials or equipment will be mishandled. Incorporate information sessions on good housekeeping practices into employee training programs, discuss good housekeeping at employee meetings, promote pollution prevention concepts through posters, brochures, newsletters, etc., and post bulletin boards with updated good housekeeping procedure tips and reminders.

3. Inspections and Record Keeping

Continuous

- Maintain up to date records of good housekeeping practices, spill logs, and annual site inspection records; including whom, when, and where inspections were done, what was found, and any actions that were taken as a result of the inspections. Document all relevant inspection activities on the proper forms provided in the SWPPP.
- The comprehensive site inspection shall include a review of the routine inspection reports, good housekeeping inspection reports, spill documentation, employee training reports, and any other paperwork associated with the storm water program.

Once every two weeks

- Set up a schedule for routine inspections. There should also be a list of tasks to be done during each of the inspections. It is recommended that inspections be performed at least once every two weeks. Inspections should focus on areas that have a greater potential to contaminate storm water and should include housekeeping activity areas, preventative maintenance items, material handling areas, fueling areas, etc.

Quarterly (March, June, August, October)

- Comprehensive site inspections are required by the storm water permit and must occur quarterly by a certified storm water operator. See the Municipal Maintenance Yard Inspection Checklist in Appendix A.

B. SOP 120. Vehicle and Equipment Washing Areas

1. Procedures/Practices

Continuous

- Sweep, vacuum or mop floors, sidewalks, and pavement rather than hosing them down.
- Perform vehicle/equipment washing in a designated covered facility (indoors when possible). Always wash away from storm drains and drinking water wells.
- Wash water effluent should be recycled, collected, or treated prior to discharge to the sanitary sewer system.
- Obtain and use drain guards (filter inserts) to catch sediments, petroleum products, etc. that might enter the storm drains as a result of vehicle washing.
- Install curbs, berms, or dikes around outdoor wash areas to control and contain wastewater. Drain to the sanitary sewer after treatment if recycling is not feasible.
- If power washing without detergents or soaps, wastewater may only drain to vegetated areas or areas where it can evaporate. Do not let wastewater enter storm drains.
- If detergents are used while pressure washing, use phosphate-free, biodegradable detergents and only use in locations where the wastewater will be discharged to the sanitary sewer.

Weekly

- Inspect and maintain washing equipment, especially the hoses, wands, and nozzles. Make sure they deliver the proper rate of water and shutoff automatically when not in use.

2. Employee Training

Continuous

- Employee training at a minimum should include the following SWPPP components: preventative maintenance and good housekeeping practices, proper fueling procedures, material handling including spill prevention and response, internal spill and response procedures should be a component of the spill prevention and response plan.

At least once per year

- Frequent and proper training of employees reduces the potential that materials or equipment will be mishandled. Incorporate information sessions on good housekeeping practices into employee training programs, discuss good housekeeping at employee meetings, promote pollution prevention concepts through posters, brochures, newsletters, etc., and post bulletin boards with updated good housekeeping procedure tips and reminders.

3. Inspections and Record Keeping

Continuous

- Maintain up to date records of good housekeeping practices, spill logs, and annual site inspection records; including whom, when, and where inspections were done, what was found, and any actions that were taken as a result of the inspections. Document all relevant inspection activities on the proper forms provided in the SWPPP.
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Quarterly (March, June, August, October)

- Comprehensive site inspections are required by the storm water permit and must occur quarterly by a certified storm water operator. See the Municipal Maintenance Yard Inspection Checklist in Appendix A.

C. SOP 130. Vehicle and Equipment Fueling Areas

1. Procedures/Practices

Continuous



Uncovered fueling station



Covered fueling station

- A spill kit and covered garbage container should be located near the fueling area and should be well labeled for individuals to use when needed.
- Remain in attendance outside the vehicle and within view of the hose nozzle during fueling operations.
- Post information describing spill response procedures including how and to whom spills or releases are to be reported.
- When fueling small equipment like lawn mowers, small sweepers, weed whackers, blowers, portable generators, etc. in the field, do so over a paved (concrete) area well away from any storm drains or ditches. When pouring fuel from a jerry can, use a funnel.
- Cover storm drains during loading/transfer of fuel storage tanks.
- Install barrier protection posts.
- For new or remodeled facilities, consider ways to grade the site so that storm water is diverted away from fueling, storage, and disposal areas.
- Spill cleanup material should be located near the fueling area.
- Use overflow protection devices on tank systems and enclose fuel tanks and other large liquid containers within secondary containment.
- Report leaks as a result of fueling.

- Clean up spills immediately with absorbents, and properly sweep up and dispose of absorbent material. Never hose down the area or sweep into a storm drain/catch basin.

Daily

- Inspect fueling areas daily and sweep with a street sweeper on a regular basis. Designate employee(s) to perform these inspections and proper documentation.

Inspect Daily; Sweep Weekly

- Inspect fueling areas daily and sweep with a street sweeper on a regular basis. Designate employee(s) to perform these inspections and proper documentation.

Weekly

- Maintain all fueling equipment in good working order in accordance with local, state and federal laws. Conduct preventive maintenance.
- Regularly inspect fueling equipment for corrosion and structural failure, cracks in foundations, and physical damage to container systems.

Inspect Every Six Months; Maintain As Needed

- If oil/water separators are used, regular maintenance is required. Check fluid levels during inspection.

2. Employee Training

Continuous

- Employee training at a minimum should include the following SWPPP components: preventative maintenance and good housekeeping practices, proper fueling procedures, material handling including spill prevention and response, internal spill and response procedures should be a component of the spill prevention and response plan.

At least once per year

- Frequent and proper training of employees reduces the potential that materials or equipment will be mishandled. Incorporate information sessions on good housekeeping practices into employee training programs, discuss good housekeeping at employee meetings, promote pollution prevention concepts through posters, brochures, newsletters, etc., and post bulletin boards with updated good housekeeping procedure tips and reminders.

3. Inspections and Record Keeping

Continuous

- Maintain up to date records of good housekeeping practices, spill logs, and annual site inspection records; including whom, when, and where inspections were done, what was found, and any actions that were taken as a result of the inspections. Document all relevant inspection activities on the proper forms provided in the SWPPP.
- The comprehensive site inspection shall include a review of the routine inspection reports, good housekeeping inspection reports, spill documentation, employee training reports, and any other paperwork associated with the storm water program.

Once every two weeks

- Set up a schedule for routine inspections. There should also be a list of tasks to be done during each of the inspections. It is recommended that inspections be performed at least once every two weeks. Inspections should focus on areas that have a greater potential to contaminate storm water and should include housekeeping activity areas, preventative maintenance items, material handling areas, fueling areas, etc.

Quarterly (March, June, August, October)

- Comprehensive site inspections are required by the storm water permit and must occur quarterly by a certified storm water operator. See the Municipal Maintenance Yard Inspection Checklist in Appendix A.

D. SOP 140. Outdoor Storage

1. Procedures/Practices

Continuous

- Locate dumpsters on a flat paved surface that is a convenient and easily observable area, away from surface water and storm sewer inlets whenever possible.
- All dumpsters and waste receptacles should be leak-tight with lids to keep rain water out.
- Store bulk materials under cover and make sure all containers are labeled and stored correctly. Store indoors whenever possible.
- Make sure all containers and recycling bins are labeled sufficiently to identify the material inside and reduce the amount of garbage disposed of. Keep materials in their original shipping container whenever possible. Do not mix dissimilar wastes in the same containers.
- Store containers where they are protected from vehicle traffic; either away from traffic or protected by crash posts.
- Dispense, handle, and transfer materials to avoid drips, spills or accidents. Do not leave containers open for any longer than it takes to add or remove material. Close or seal each container securely after using it.



Full dumpster



Outdoor covered storage of chemicals/gas with clear warning signs

- Install berms or curbs around the storage area to prevent runoff and runoff.
- Never place liquids or liquid-containing wastes in a dumpster or trash receptacle.
- If there is unavoidable leakage, enclose the area. Enclosing the area consists of storing the waste receptacles under a roof and curbing the area to trap the leakage.

The fluid that has leaked from the dumpster is usually classified as a liquid industrial waste and the storm water general permit does not authorize this discharge.

- Do not drain accumulated water from secondary containment structures unless approved by a supervisor.
- Do not wash out waste containers or dumpsters outdoors. Return dumpsters to the owners for cleaning at the owner's facility. If municipally-owned containers must be washed, do so at an approved location where wastewater is either recycled or is treated before discharging to the sanitary sewer.

Daily

- Sweep around outdoor waste areas regularly.

2. Employee Training

Continuous

- Employee training at a minimum should include the following SWPPP components: preventative maintenance and good housekeeping practices, proper fueling procedures, material handling including spill prevention and response, internal spill and response procedures should be a component of the spill prevention and response plan.

At Least Once/Year

- Frequent and proper training of employees reduces the potential that materials or equipment will be mishandled. Incorporate information sessions on good housekeeping practices into employee training programs, discuss good housekeeping at employee meetings, promote pollution prevention concepts through posters, brochures, newsletters, etc., and post bulletin boards with updated good housekeeping procedure tips and reminders.

3. Inspection and Record Keeping

Continuous

- Maintain up to date records of good housekeeping practices, spill logs, and annual site inspection records; including whom, when, and where inspections were done, what was found, and any actions that were taken as a result of the inspections. Document all relevant inspection activities on the proper forms provided in the SWPPP.

- The comprehensive site inspection shall include a review of the routine inspection reports, good housekeeping inspection reports, spill documentation, employee training reports, and any other paperwork associated with the storm water program.

Once Every Two Weeks

- Set up a schedule for routine inspections. There should also be a list of tasks to be done during each of the inspections. It is recommended that inspections be performed at least once every two weeks. Inspections should focus on areas that have a greater potential to contaminate storm water and should include housekeeping activity areas, preventative maintenance items, material handling areas, fueling areas, etc.

Quarterly (March, June, August, October)

- Comprehensive site inspections are required by the storm water permit and must occur quarterly by a certified storm water operator. See the Municipal Maintenance Yard Inspection Checklist in Appendix A.

E. SOP 150. Salt Storage

1. Procedures/Practices

Continuous

- Store all solid salt and sand/salt mixtures in an enclosed building, or cover with waterproof tarps.
- Drainage paths and structures should be scraped clean of all salt and sand/salt mixtures after trucks are loaded and dispatched.

During Construction

- Construct loading areas on a covered or enclosed impervious pad within the storage structure to prevent the generation of salt contaminated runoff.

During Construction and As Needed

- Surround loading areas with curbing or grade to direct salt contaminated runoff to an appropriate collection area away from catch basins or storm sewer system inlets.

2. Employee Training

Continuous

- Employee training at a minimum should include the following SWPPP components: preventative maintenance and good housekeeping practices, proper fueling procedures, material handling including spill prevention and response, internal spill and response procedures should be a component of the spill prevention and response plan.

At Least Once/Year

- Frequent and proper training of employees reduces the potential that materials or equipment will be mishandled. Incorporate information sessions on good housekeeping practices into employee training programs, discuss good housekeeping at employee meetings, promote pollution prevention concepts through posters, brochures, newsletters, etc., and post bulletin boards with updated good housekeeping procedure tips and reminders.

3. Inspections and Record Keeping

Continuous

- Maintain up to date records of good housekeeping practices, spill logs, and annual site inspection records; including whom, when, and where inspections were done,

what was found, and any actions that were taken as a result of the inspections. Document all relevant inspection activities on the proper forms provided in the SWPPP.

- The comprehensive site inspection shall include a review of the routine inspection reports, good housekeeping inspection reports, spill documentation, employee training reports, and any other paperwork associated with the storm water program.

Once Every Two Weeks

- Set up a schedule for routine inspections. There should also be a list of tasks to be done during each of the inspections. It is recommended that inspections be performed at least once every two weeks. Inspections should focus on areas that have a greater potential to contaminate storm water and should include housekeeping activity areas, preventative maintenance items, material handling areas, fueling areas, etc.

Quarterly (March, June, August, October)

- Comprehensive site inspections are required by the storm water permit and must occur quarterly by a certified storm water operator. See the Municipal Maintenance Yard Inspection Checklist in Appendix A.

F. SOP 160. General Pollution Prevention/Good Housekeeping Procedures

1. Procedures/Practices

Continuous

- Keep things covered.
- Post signs and labels in problem areas, and areas with hazardous materials.
- Safeguards including safety posts, barriers, or fences, should be installed around high risk areas.
- Consider additional control measures in conjunction with coverings, including curbing, grading, or elevating materials, diversions, storm water conveyances, diversion dikes, etc.
- Identify and label any storm drain inlets at or near the facility to notify employees and contractors not to dispose of any materials or wastes there.
- Do not wash down or hose down any outdoor work areas or trash/waste container storage areas except where wash water will only enter the sanitary sewer following treatment.
- Recycle wastes, used oil, solvents, grease rags, wash water, and other spent liquids. Store materials awaiting recycling under cover with secondary containment.
- Install secondary containment devices where appropriate. Secondary controls include curbing, drip pans, basins, sumps, oil/water separators, catch basin inserts, oil pads/skimers, and impervious work areas.
- Use oil/water separators, or other commercially-available devices to eliminate or minimize oil and grease pollution of storm water runoff.
- Stabilize exposed soil areas to prevent soil from eroding during rain events. This can be done by vegetating the area, preferably with a mulch or binder that will hold the soils in place.
- Install sediment controls. Examples include sediment control fences, fabric-covered triangular dikes, gravel-filled burlap bags, biobags or hay bales staked in place, and sediment detention ponds.
- Consider storm water filters, detention ponds or wetlands.

Daily

- Regularly sweep City facility's to clean up salt/other materials and prevent mobilization of pollutants in storm water. Develop a schedule for sweeping paved areas and floors, including who will perform the sweeping.

Weekly

- Monitor floor drains and storm inlets and/or catch basins, and inspect, remove/replace as appropriate.

Monthly

- Inspect oil/water separators and floor drain systems periodically to determine maintenance needs.

2. Employee Training

Continuous

- Employee training at a minimum should include the following SWPPP components: preventative maintenance and good housekeeping practices, proper fueling procedures, material handling including spill prevention and response, internal spill and response procedures should be a component of the spill prevention and response plan.

At Least Once/Year

- Frequent and proper training of employees reduces the potential that materials or equipment will be mishandled. Incorporate information sessions on good housekeeping practices into employee training programs, discuss good housekeeping at employee meetings, promote pollution prevention concepts through posters, brochures, newsletters, etc., and post bulletin boards with updated good housekeeping procedure tips and reminders.

3. Inspections and Record Keeping

Continuous

- Maintain up to date records of good housekeeping practices, spill logs, and annual site inspection records; including whom, when, and where inspections were done, what was found, and any actions that were taken as a result of the inspections. Document all relevant inspection activities on the proper forms provided in the SWPPP.

- The comprehensive site inspection shall include a review of the routine inspection reports, good housekeeping inspection reports, spill documentation, employee training reports, and any other paperwork associated with the storm water program.

Once Every Two Weeks

- Set up a schedule for routine inspections. There should also be a list of tasks to be done during each of the inspections. It is recommended that inspections be performed at least once every two weeks. Inspections should focus on areas that have a greater potential to contaminate storm water and should include housekeeping activity areas, preventative maintenance items, material handling areas, fueling areas, etc.

Quarterly (March, June, August, October)

- Comprehensive site inspections are required by the storm water permit and must occur quarterly by a certified storm water operator. See the Municipal Maintenance Yard Inspection Checklist in Appendix A.

II. SOP SERIES 200. STRUCTURAL STORMWATER CONTROL EFFECTIVENESS

Purpose of SOP Series 200

To inspect and maintain detention basins and rain gardens; handle any waste removed from each site; and to design and install new structural controls that meet the treatment volume standard and channel protection criteria established in the new stormwater ordinance. To track maintenance activities and quantities of waste removed.

Related Guidance

- USEPA National Menu of BMPs
- USEPA Stormwater Phase II Final Rule Fact Sheet Series
- MDEQ Guidebook of BMPs:
 - Constructed Wetland
 - Extended Detention Basin
 - Pond Construction and Management
 - Stabilized Outlets
 - Wet Detention Basin
- Low Impact Development Manual for Michigan

Other Related SOPs

- Post-Construction Control
- Managing Vegetated Properties

A. SOP 210. Dry Detention Basin Maintenance

1. Procedures/Practices

Continuous

- Allow bank vegetation to grow including riparian trees and shrubs to discourage geese, facilitate filtration, and create wildlife habitat, but maintain/mow appropriate areas for access.



Naturalized detention basin

Photo Source: City of Chicago Water Management.

www.cityofchicago.org/city/en/depts/water/supp_info/conservation/green_design/naturalized_dententionbasins.html

- Set mower blades on higher setting to avoid scalping. Avoid mowing or using heavy equipment after or during a rain event when ground is soft.
- Apply fertilizer on banks sufficiently to maintain plant vigor, but do not overfertilize. Maintain soil pH by not applying ammonia-based fertilizers as they are acidic. Avoid using other landscaping chemicals in basin area or in areas where the residue could wash into the basin during a storm event.
- Notify supervisor of any hazardous conditions or materials found during activities. Do not attempt to clean up any unidentified or hazardous materials.
- Do not clean or maintain equipment in the detention basin area, near a storm drain, or near a stormwater conveyance feature. This should be done at a maintenance facility.

Monthly or Weekly

- When mowing, collect grass clippings and all other clippings/trimmings and take offsite for disposal to City compost.

Monthly

- Remove debris/trash from the basin and surrounding area and dispose of properly.



Trash and organic debris need to be removed

- Control pests, such as beavers and muskrats, by destroying holes to maintain integrity of embankments. Call a professional trapper to remove pests if necessary.



Muskrat damage

Photo Source: Rid-A-Critter. www.ridacritter.com

Monthly and after storms >2 inches

- Keep screen, trash racks, and/or drawdown pipes free from debris.

Annually

- Measure the depth of the sediment forebay in the same spot annually. Can install a permanent stake to measure sediment depth.

As needed

- Report damage/compromise to side slopes, banks, inlet pipe, trickle channels, outlet structure; prepare a repair schedule and complete repairs.
- Remove vegetation adjacent to outlet works that may interfere with operation; note if noxious weeds, such as phragmites, are present and notify supervisor to schedule treatment/removal.



Phragmites – a noxious weed

Photo Source: http://vilaslandandwater.org/ais_pages/ais_species_phragmites_page.htm

- Keep trees and shrubs off embankments and maintain emergency spillways.

- Maintain fence and gates by fixing breaches and removing vegetative overgrowth. Dispose of vegetation offsite at the City compost.

As Needed (typically 5-10 years)

- Remove sediment from sediment forebay and regrade when accumulated sediment volume exceeds 25% of forebay volume. Determine if sediment is hazardous, for example if it is downstream from an industrial facility, and dispose of in a landfill.



Cleaning sediment from forebay

Photo Source: Hunt, W. and Lord, B. (2006). Urban Waterways: Maintenance of Stormwater Wetland and Wet Ponds. North Carolina Cooperative Extension Service.

2. Employee Training

Continuous

- Employee training at a minimum should include: locations of dry detention basins; identification of inlet and outlet structures requiring maintenance, including trash racks, drawdown pipes, embankments, and sediment forebays; procedures for measuring depth of sediment; proper locations for disposing of trash, litter, and vegetation; and mowing and fertilizing procedures for basins.

At Least Once/Year

- Frequent and proper training of employees increases the effectiveness of structural stormwater controls and decreases the potential that materials or equipment will be mishandled. Incorporate information sessions on proper maintenance of dry detention basins into employee training programs, employee meetings, through posters, brochures, newsletters, etc., and post bulletin boards with updated procedure tips and reminders for maintaining detention basins.

3. Inspections and Record Keeping

Continuous

- Maintain up to date records of maintenance and site inspections; including whom, when, and where inspections were done, what was found, and any actions that were taken as a result of the inspections.

Monthly, and after storms >2 inches, then As Needed

- Inspect detention basins for trash accumulation at outlets and inlets monthly for the first year so that a schedule can be determined for each basin based on need. Trash needs to be removed to prevent clogging of outlets/inlets and each structure has a different rate of trash accumulation. See the Municipal Structural Stormwater Control Inspection Checklist in Appendix B.

B. SOP 220. Wet Detention Basin Maintenance

1. Procedures/Practices

Continuous

- Allow bank vegetation to grow including riparian trees and shrubs to discourage geese, facilitate filtration, and create wildlife habitat, but maintain/mow appropriate areas for access.
- Set mower blades on higher setting to avoid scalping. Avoid mowing or using heavy equipment after or during a rain event when ground is soft.
- Maintain aquatic shelf along bank edges for safety. Suggestions for plantings on aquatic shelf include Buttonbush, Swamp Rose, Pickeral Weed, and Spatterdock. Suggestions for plantings along edge of aquatic shelf include Red Osier Dogwood, Autumn Willow, Common Rush, Tussock Sedge, and Bulrush Scripus. Plant these species instead of grass to deter geese.



Wet pond with vegetative growth on banks

Photo Source: City of Chicago Water Management.

www.cityofchicago.org/city/en/depts/water/supp_info/conservation/green_design/naturalized_detentionbasins.html

- Apply fertilizer on banks sufficiently to maintain plant vigor, but do not overfertilize. Maintain soil pH by not applying ammonia-based fertilizers as they are acidic. Avoid using other landscaping chemicals in basin area or in areas where the residue could wash into the basin during a storm event.
- Notify supervisor of any hazardous conditions or materials found during activities. Do not attempt to clean up any unidentified or hazardous materials.
- Do not clean or maintain equipment in the detention basin area, near a storm drain, or near a stormwater conveyance feature. This should be done at a maintenance facility.

Monthly

- Remove debris/trash from the basin and surrounding area and dispose of properly. Trash removal may require a boat.

- Control pests, such as beavers and muskrats, by destroying holes to maintain integrity of dams. Call a professional trapper to remove pests if necessary.

Monthly or weekly

- When mowing, collect grass clippings and all other clippings/trimmings and take offsite for disposal to City compost.

Monthly, and after storms >2 inches

- Keep screen, trash racks, and/or drawdown pipes free from debris.

Annually

- Measure the depth of the sediment forebay and deep pool of basin in the same spot annually.



Pond depth measurement

Photo Source: <http://ssuresearchmethodsclass.blogspot.com>.

As Needed

- Report damage/compromise to side slopes, banks, inlet pipe, trickle channels, outlet structure; prepare a repair schedule and complete repairs.
- Remove vegetation adjacent to outlet works that may interfere with operation; note if noxious weeds, such as phragmites, are present and notify supervisor to schedule treatment/removal.
- Keep trees and shrubs off embankments and maintain emergency spillways.
- Address algae when growth first appears. Algae may be raked out or treated with Cutrine-Plus copper compound which is less toxic than the traditionally-used Bluestone (copper sulfate). Follow manufacturer's instructions.

- Cloudy water can be cleared with gypsum, barley straw bales, or wheat straw bales.
- Maintain fence and gates by fixing breaches and removing vegetative overgrowth.
Dispose of vegetation offsite at the City compost.

As Needed (typically 5-10 years)

- Remove sediment from sediment forebay and regrade when accumulated sediment volume exceeds 25% of forebay volume or when the average sediment depth is within 1 foot from the water surface. Determine if sediment is hazardous, for example if it is downstream from an industrial facility, and dispose of in a landfill.
- Remove sediment from the final deep pool of the pond when the average sediment depth is within 1 foot of the drawdown orifice. Determine if sediment is hazardous, for example if it is downstream from an industrial facility, and dispose of in a landfill.

2. Employee Training

Continuous

- Employee training at a minimum should include: locations of wet basins; identification of inlet and outlet structures requiring maintenance including trash racks, drawdown pipes, embankments, sediment forebays, and sumps; procedures for measuring depth of sediment; proper locations for disposing of trash, litter, and vegetation; mowing and fertilizing procedures for basins; and procedures for addressing algae and cloudy water for wet basins.

At Least Once/Year

- Frequent and proper training of employees increases the effectiveness of structural stormwater controls and decreases the potential that materials or equipment will be mishandled. Incorporate information sessions on proper maintenance of structural stormwater controls into employee training programs, employee meetings, through posters, brochures, newsletters, etc., and post bulletin boards with updated procedure tips and reminders for maintaining detention basins.

3. Inspections and Record Keeping

Continuous

- Maintain up to date records of maintenance and site inspections; including whom, when, and where inspections were done, what was found, and any actions that were taken as a result of the inspections.

Monthly and after storms >2 inches, then As Needed

- Inspect detention basins for trash accumulation at outlets and inlet sumps monthly for the first year so that a schedule can be determined for each basin based on need. Trash needs to be removed to prevent clogging of outlets/inlets and each structure has a different rate of trash accumulation. See the Municipal Structural Stormwater Control Inspection Checklist in Appendix B.

C. SOP 230. Rain Garden Maintenance

1. Procedures/Practices

Continuous

- Always ensure minimal impact to soils and plants when working in and around the rain gardens.
- Never hose down anything into a rain garden. The sediment will clog the garden.

Every 2 Weeks to Monthly

- Remove litter from the rain gardens and immediate surroundings with the least amount of impact to the garden as possible. Use of trash tongs may alleviate impact. Dispose of litter off-site in a proper trash receptacle.

Monthly and After Storms >2 inches

- Remove litter and sediment from sumps or forebays. A Vactor truck may be appropriate for this task. Some sumps/forebays may need cleaning more frequently than others. Inspect sumps after every storm event for the first year to determine cleaning frequency at each location. Determine if sediment is hazardous, for example if it is downstream from an industrial facility, and dispose of in a landfill.

Spring and Fall, Depending on Species

- Prune trees and bushes to maintain neatness and to prevent encroachment on smaller plants. A professional should conduct this activity. Dispose of vegetation in City compost.

Annually in the Spring

- Remove or redistribute mulch in locations where it is greater than 2 inches thick.



**Michigan Avenue Rain
Garden**



**Michigan Avenue Rain
Garden**



**Washington Square Rain
Garden**

Annually in the Spring, Prior to Mulching

- Replace dead or diseased plants and trees to obtain a neat appearance and maintain water quality treatment capabilities. Vegetated areas needing replacement should be noted with a flag in the Fall for replacement during the following Spring. It may be helpful to seek a professional's advice before replacement to determine if a species is not suitable for conditions in that garden and to recommend another.

Mid-summer and Fall

- Weed by hand to control unwanted vegetation. Do not use pesticides. Do not bring equipment into rain gardens. Dispose of vegetation in City compost.

Annually in the Fall

- Thin plants and remove encroaching species to maintain original balance and proportion of species in the rain garden. Re-use the thinned plants in other gardens where needed or donate to local gardeners. It may be helpful to seek a professional's advice before thinning so as not to remove too many plants or to determine if a species is not suitable for conditions in that garden.

Every 2 Years, or As Needed

- Place 2 inches of aged (6 weeks to 12 months), untreated, shredded, hardwood mulch within the rain garden immediately following weeding and plant replacement to inhibit weed growth and protect plants. Use pitch forks to carefully place mulch. Shredded mulch is important because it does not float like chipped mulch does.

Every 5 Years or As Needed

- Clean underdrain to ensure that flow is able to pass to avoid basement flooding. Inspect outlet of underdrain for signs of stormwater discharge. If there are no signs, run water down cleanout to see if flow discharges. If still no flow, televise underdrain. Underdrains may need periodic rooting. Note that flow may not be present due to perforated pipe or complete uptake of water by vegetation.

As Needed

- In some locations, fencing must be removed to access rain gardens. Remove and reinstall fencing immediately prior to and following work to minimize damage to gardens and liability. For safety purposes, provide temporary access restriction to garden opening using orange flagging tape or cones.
- Water plants during times of severe drought as indicated by one or both of the following: 1) Plants wilt during the heat of the day and do not recover in the evening; 2) Soil is dry 4 inches below the surface.

- Replace damaged fencing and other associated rain garden structures, such as metal plates and signage on Michigan Avenue.

2. Employee Training

Continuous

- Employee training at a minimum should include: locations of rain gardens; identification of inlet and outlet structures requiring maintenance including trash racks, drawdown pipes, sediment forebays, and sumps; procedures for measuring depth of sediment; proper locations for disposing of trash, litter, and vegetation; general purpose and operation of a rain garden; plant identification for weeding rain gardens; rain garden mulching procedures; tree and shrub pruning procedures; drought watering procedures for rain gardens; and underdrain cleaning procedures.

At Least Once/Year

- Frequent and proper training of employees increases the effectiveness of structural stormwater controls and decreases the potential that materials or equipment will be mishandled. Incorporate information sessions on proper maintenance of structural stormwater controls into employee training programs, employee meetings, through posters, brochures, newsletters, etc., and post bulletin boards with updated procedure tips and reminders for maintaining detention ponds and rain gardens.

3. Inspections and Record Keeping

Continuous

- Maintain up to date records of maintenance and site inspections; including whom, when, and where inspections were done, what was found, and any actions that were taken as a result of the inspections. See the Municipal Structural Stormwater Control Inspection Checklist in Appendix B.

Monthly, and After Storms >2 inches, Then As Needed

- Inspect rain gardens for trash accumulation at outlets and inlet sumps monthly for the first year so that a schedule can be determined for each rain garden based on need. Trash needs to be removed to prevent clogging of outlets/inlets and each structure has a different rate of trash accumulation.

Annually

- Inspect rain garden structural integrity including fencing, metal plates (Michigan Ave.), inlets, outlets, and retaining walls.

Every 5 Years, or As Needed

- Inspect rain garden underdrains for signs of stormwater discharge. If there are no signs, run water down cleanout to see if flow discharges. If still no flow, televise underdrain. Underdrains may need periodic rooting. Note that flow may not be present due to perforated pipe or complete uptake of water by vegetation.

D. SOP 240. Design Guidelines for New Construction

1. Procedures/Practices

During Design

- Use pretreatment structures upstream of a detention basin to treat the water quality volume. Examples include bioretention, bioswales, and filter strips.
- Incorporate controls into a detention basin such as a sediment forebay and outlet control to create extended detention.
- Consider using wet ponds or constructed wetlands in place of dry detention basins. Wet ponds/wetlands remove total suspended solids better than do dry detention basins.
- Size and position the low flow orifice to detain the calculated water quality runoff volume for at least 24 hours.
- For basins, a minimum length-to-width ratio of 2:1 is recommended to maximize sedimentation. Alternatively, baffles could be constructed to lengthen the flow path.
- Wet ponds should be 3 to 6 feet deep to minimize thermal stratification and short-circuiting and deep enough to prevent sediment resuspension, reduce algae blooms, and maintain aerobic conditions.
- Install trash racks or other protective device to protect the outlet orifices.

III.SOP SERIES 300. CONTROL OF SOLIDS AND CONTAMINANTS FROM CITY'S PAVED SURFACES

Purpose of SOP Series 300

To control total suspended solids runoff from the City's paved surfaces through good housekeeping and pollution prevention measures including proper salt/sand application, catch basin cleaning, storm sewer cleaning, and street sweeping. See Appendix C for the Catch Basin Cleaning Form.

Related Guidance

- USEPA National Menu of BMPs
- USEPA Stormwater Phase II Final Rule Fact Sheet Series
- MDEQ Guidebook of BMPs:
 - Winter Road Management
 - Street Sweeping
 - Porous Asphalt Pavement
 - Catch Basins

Other Related SOPs

- Pollution Prevention for Fleet Maintenance and Storage Yards
- IDEP
- Construction Stormwater Runoff and Erosion Control

A. SOP 310. Parking Lot and Street Cleaning Maintenance

1. Procedures/Practices

Continuous

- Start at the “top” (upstream end of the sewer system and furthest from the river) of town and work down.
- Make sure street sweeping brushes, water spray hoses, and equipment are functional before leaving the shop. Keep vehicles properly maintained.
- Sweep using a modern machine that is capable of picking up fine grained sediment particles that carry a substantial portion of the storm water pollutant load. Consider dry vacuum assisted sweepers.
- For porous pavement, use a vacuum sweeper to clean sediment/debris.
- Operate all sweepers according to the manufacturer’s recommended procedures to get optimal debris removal. This includes adjusting sweeper speed, brush alignment, rotation rate, and sweeping pattern.
- Do not “wash down” any streets or curbs (fine water spray for dust control is acceptable but it should use as little water as possible).
- Never purposely sweep into the storm drain system.
- Disposal of debris should be done on a regular basis and debris should not be allowed to accumulate. Track the number of loads or cubic yards disposed of.
- Ensure that debris from sweeper hoppers is collected and taken to a temporary storage area or directly to its permanent disposal site. Disposal in a landfill is often necessary, unless the material has been tested and declared inert which can then be reused.
- Do not store street sweepings or empty sweeper hoppers, even temporarily, near storm drains or surface water bodies or where wind or rain could scatter the debris.
- Sweeper wastewater should always be decanted to the sanitary sewer, never to storm sewers.
- Protect nearby (within 25 feet) storm drain inlets from maintenance work (e.g. preparing the surface for asphalt cap, chip sealing, concrete breaking or saw cutting). Place covers, sand bags, filter fabric, or plastic around or over inlets to protect them from entry of wastes, dusts, overspray, or slurry.
- Paving operations should be performed using concrete, asphalt, or other sealers only in dry weather situations to prevent contamination of runoff.

At a Minimum, Once a Year

- Sweep streets in the fall to remove leaf litter before it washes down into and clogs the storm sewer system.

At a Minimum, Twice a Year

- Perform street sweeping on public streets and municipal parking lots to reduce the amount of sediment, debris and organic matter entering the catch basins, which in turn reduces the frequency with which they will need to be cleaned. At a minimum, sweep twice per year at least once during the fall to collect leaves and once during the spring immediately after snowmelt.

Four Times/Year

- Sweep downtown areas and areas adjacent to the river more frequently.

As Needed

- Sweep after a heavy rain storm where sediment is present in roads/streets.
- Sweep immediately after a special event if needed like street fairs, art shows, and parades where additional debris is likely to have accumulated.

As Needed to Keep Streets Clear of Accumulated Debris

- Sweep in locations that generate debris, such as construction entrances, sand/salt loading areas, vehicle fueling areas, and vehicle and equipment storage areas on an as needed basis.

Before Start of Construction

- Consider shouldered roads instead of curbed roads.

2. Employee Training

Continuous

- Frequent and proper training of employees reduces the potential that materials or equipment will be mishandled. Incorporate information sessions on street sweeping into employee training programs, discuss at employee meetings, and post bulletin boards with updated tips and reminders.

As Needed

- Employee training at a minimum should include: proper street sweeping techniques and waste disposal.

3. Inspections and Record Keeping

Continuous

- Document inspections, cleanings and repairs and maintain complete records in a record-keeping system. Use documentation of repairs and maintenance to develop a capital improvement and O&M plan for future system maintenance.
- Maintain up to date records of quantity of streets cleaned and quantities of waste removed.
- Maintain accurate logs of the date and number of curb-miles swept, the amount of waste collected, and any material testing results.

At Beginning of Maintenance/Inspection Cycle

- Set up a schedule for routine maintenance and inspections for storm sewer system and parking lot and street maintenance. There should also be a list of tasks to be done during each of the inspections.

B. SOP 320. Salt/De-icing and Snow Storage Procedures

1. Procedures/Practices

Continuous

- When loading salt, sand, or deicer, take care to minimize salt spillage by not exceeding the capacity of equipment (i.e. front end loader, truck bed).



Overfill of equipment that led to a spill

- Equip all spreaders with ground-speed controllers and use a wetting agent to minimize “bounce”. Operate trucks at a low speed (25 mph is recommended) to decrease bounce and scatter of salt spread to reduce salt waste and keep more salt on the roadway.
- Control spread patterns to concentrate material where it is most effective. Examples include windrow application or spreading on a 4-8 foot strip down the center line for less traveled roads.
- Keep salt piles, sand piles, and stored deicers covered or inside buildings where precipitation or runoff will not come in contact with them.



Salt stored uncovered with direct discharge to a storm drain

- Locate sand/salt stockpiles and deicing fluid tanks on flat, impervious sites that are easily protected from overland runoff and at least 100 feet from streams and flood plains.
- Place berms where runoff leaves the salt storage areas to contain any salt waste or direct runoff to holding tanks or stormwater treatment devices.
- Identify sensitive ecosystems prior to identifying snow disposal areas. Inform salt applicators by installing permanent sensitive area signs and avoid snow disposal and salt application in these areas.
- Apply as little sand, salt, and deicer as needed to be effective, and no more than the MDOT recommended application rates (based on level of service).
- When using sand, use coarse, clean “washed” sand, which is free of fine particles and dust and easier to clean in the spring.
- Consider use of de-icing alternatives such as calcium magnesium acetate, potassium acetate, sand, etc. in sensitive areas.

Once/Year

- Street sweep accumulated salt and sand at the end of the season.

At Least Once/Year

- Routinely calibrate salt spreaders according to manufacturer’s instructions to maximize the effectiveness of the device. At a minimum, calibrate before winter operations begin and after any maintenance is performed on the spreader/truck.

At Least Twice/Year

- Clear debris in the snow storage area(s) each year prior to and following snow storage use.

As Needed

- Know when to plow and reapply salt; allowing maximum melting by salt before plowing.
- Remove snow manually and hand-apply deicer or salt on driveways and sidewalks. Use sparingly.

As Needed After Storm Events

- Cleanup “track out” after storm events.

2. Employee Training

Continuous

- Frequent and proper training of employees reduces the potential that materials or equipment will be mishandled. Incorporate information sessions on salting/deicing application techniques into employee training programs, discuss at employee meetings, and post bulletin boards with updated tips and reminders.

At Least Once/Year

- Train employees in proper deicing application techniques, the timing of deicer application, and what type of deicer to apply.

As Needed

- Employee training at a minimum should include: proper salting/deicing application techniques, the timing of application, and what type of deicer to apply.

3. Inspections and Record Keeping

Continuous

- Document inspections, cleanings and repairs and maintain complete records in a record-keeping system. Use documentation of repairs and maintenance to develop a capital improvement and O&M plan for future system maintenance.
- Maintain up to date records of quantity of sand and salt applied, and number of salt trucks calibrated.

C. SOP 330. Storm Sewer System Maintenance

1. Procedures/Practices

Continuous

- Never allow defective equipment or structures to go unrepaired.
- If there is evidence of gross contamination or illicit discharges (sewage or oil), stop cleaning and report to supervisor for follow up.
- Report any suspected illicit connections or dumping to the Public Service Department or the Pollution Emergency Alerting System (PEAS) at 517-373-7661.
- Use appropriate erosion and sediment control practices when performing repairs.
- Ensure that debris from vector trucks is collected and taken to a secure storage area or directly to its permanent disposal site. If temporary storage is required before pick-up, store wastes in containers (dumpsters or dump trucks) or on a paved, bermed area with containment at least 100 feet from or at a lower elevation than any storm drain inlets or ditches. Never empty vector trucks, even temporarily, near storm drains or surface water bodies or where wind or rain could re-entrain or scatter the debris.
- Discharge fluids collected during catch basin cleaning to a sanitary WWTP.



Vector truck cleaning out storm sewer following the removal of an illicit connection

Once/Year

- Inspect catch basins for structural integrity, cracks, and leaks or other condition that would lead to breakdowns in the system and repair any structures found to be leaking or damaged as soon as possible. Identify and prioritize catch basins that need repair.



Good catch basin maintenance, clean and free of trash and debris

Once Every 3 to 5 Years

- Regularly clean storm drain systems to decrease bacteria levels and increase dissolved oxygen according to pre-determined schedule with maximum activity preferably in late winter and early spring. Give priority to areas with relatively flat grades as they rarely achieve high enough flows to flush themselves.
- Clean catch basins when the debris and sediment have reached 60 percent of the capacity of the sump. Coordinate cleaning with localized street sweeping so that cleaning happens after street sweeping. Preferably cleaning should happen in the spring because in the fall, leaves help trap sediment in the catch basin. Create a checklist for catch basins to help classify which catch basins require maintenance and generally how often.

Televise Every 5 Years

- Practice preventative maintenance for cracks, leaks, and other conditions that could cause breakdowns in the system. Identify needed maintenance through inspections and televising.

As Needed

- Use a vactor truck to suck up flush water downstream from flushing inlets. Never discharge any contaminated stormwater or storm sewer flush water into surface waters. Discharge decanted wastewater to sanitary sewer after treatment.
- Disposal of debris should be done on a regular basis and debris should not be allowed to accumulate. Track the number of loads or cubic yards disposed of.



Catch basin covered in trash/debris that needs to be cleaned

2. Employee Training

Continuous

- Frequent and proper training of employees reduces the potential that materials or equipment will be mishandled. Incorporate information sessions on storm sewer system maintenance into employee training programs, discuss at employee meetings, and post bulletin boards with updated tips and reminders.

As Needed

- Employee training at a minimum should include: proper storm sewer system maintenance and cleaning procedures.

3. Inspections and Record Keeping

Continuous

- Document inspections, cleanings and repairs and maintain complete records in a record-keeping system. Use documentation of repairs and maintenance to develop a capital improvement and O&M plan for future system maintenance.
- Maintain up to date records of quantity of catch basins and storm sewer cleaned and quantities of waste removed.

At Beginning of Maintenance/Inspection Cycle

- Set up a schedule for routine maintenance and inspections for storm sewer system. There should also be a list of tasks to be done during each of the inspections. See Appendix C for the Catch Basin Cleaning Form.

IV. SOP SERIES 400. POST-CONSTRUCTION STORMWATER CONTROLS

Purpose of SOP Series 400

To develop procedures for staff to review site plans adhering to the post-construction control and site plan sections of the City of Lansing ordinance and the Lansing Stormwater Management Policies and Procedures Manual and Lansing Stormwater Management Design Manual. To include record-keeping and enforcement for sites needing post-construction controls. To track the number of enforcement actions, site plans reviewed, and sites where post-construction controls and/or grease interceptors are installed.

Related Guidance

- USEPA National Menu of BMPs
- USEPA Stormwater Phase II Final Rule Fact Sheet Series

A. SOP 410. Post-Construction Stormwater Controls

1. Procedures/Practices

Continuous

- Encourage applicants to schedule an informal Preliminary Review Meeting with Public Service Department staff as early in the project development phase as possible.
- Following the Preliminary Review Meeting, prepare preliminary review comments to the applicant highlighting specific issues regarding stormwater control measures that should be considered as the applicant proceeds with his site planning process and subsequent submittals. If deemed necessary, notify the applicant that a Preliminary Stormwater Management Plan Submittal and approval is required before the Public Service Department will review the final stormwater management plan and application.
- Review Preliminary Stormwater Management Plans and provide the applicant with comments within fourteen (14) days following submittal.
- In conjunction with the review of the site plan, staff must review the Stormwater Management Plan Facilities using the site plan review checklist and provide any additional comments in a response to the applicant within fourteen (14) days following submittal of the site plan (extensions beyond 14 days may be granted upon approval of the Planning Office). After all Public Service Department comments have been addressed by the applicant, staff must notify Public Service Department Permits Office staff of the conditional approval via the Site Plan Tracking Log on the

department server. The applicant is not authorized to proceed with construction of the Stormwater Management Plan Facilities until the Public Service Department Permits Office has received the associated permit fee (currently \$200) and the permit has been issued.

Every 3 to 5 years

- Review the site plan review checklist relative to the need for updating Stormwater Management Plan Facilities requirements based upon new environmental, stormwater regulations or new regulatory approaches.

2. Employee Training

As needed

- New employee(s) responsible for reviewing site plan review submittals are to be trained in the use of the site plan review checklist and the procedures in the Lansing Stormwater Management Policies and Procedures Manual and Lansing Stormwater Management Design Manual.

3. Inspections and Record Keeping

Continuous

- Using the Permits Office database, staff must maintain up-to-date records of the number of enforcement actions pursued, site plans reviewed, and sites where post-construction controls are installed (including bioretention, porous pavement, detention/retention systems, and oil/grease separators).

V. SOP SERIES 500. CONSTRUCTION STORMWATER RUNOFF CONTROL

Purpose of SOP Series 500

To notify the MDEQ of discharges of sediment and waste from construction activity to the City's MS4. To assure that developers submit site plans containing adequate SESC controls. To receive and consider complaints or other information submitted by the public regarding construction activities that discharge wastes to the MS4. To track complaints.

Related Guidance

- USEPA National Menu of BMPs
- USEPA Storm water Phase II Final Rule Fact Sheet Series
- MDEQ Guidebook of BMPs

Other Related SOPs

- Control of Solids and Contaminants from City's Paved Surfaces
- Managing Vegetated Properties

A. SOP 510. Notification to MDEQ of Discharges of Sediment and Waste to Lansing's Municipal Separate Storm Sewer System

1. Procedures/Practices

O&M Division

Immediately

- Report a discharge of sediment or waste from a construction site to the City of Lansing's Engineering Division, Assistant City Engineer.

Engineering Division

Within 24 hours

- If a discharge endangers health or the environment, report verbally to MDEQ within 24 hours from the time a discharge from a construction site is confirmed.

Within 5 days

- If a discharge endangers health or the environment, report in writing to MDEQ within 5 days from the time the discharge is confirmed. Include a description of the discharge and cause of noncompliance, the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent reoccurrence of the discharge.

2. Employee Training

At least once per year

- Employee training should include the procedure for notifying the MDEQ of discharges of sediment and waste from a construction site to the City of Lansing's Municipal Separate Storm Sewer System.

3. Inspections and Record Keeping

Continuous

- Maintain up to date records of correspondence with the MDEQ regarding a construction discharge including phone logs, e-mails, and written correspondence.
- Document all relevant inspection activities and correspondence with the permittee related to the discharge.

B. SOP 520. Site Plan Submittal

1. Procedures/Practices

Continuous

- Site plans are required to be submitted with soil erosion and sediment controls (SESC) per City of Lansing ordinance: Lansing, Michigan, Code of Ordinances, Part 12 – Planning and Zoning Code, Title 2 – Planning, Chapter 1218 – Soil Erosion and Sedimentation Control. A building permit proposing earth changes of one or more acres of land or disturbing land located within 500 feet of the waters of the State of Michigan will not be issued without approval from the City Engineer per this ordinance.

2. Employee Training

As needed

- Employees involved in the review of site plans related to SESC should be trained in the design and proper use of SESC on an as needed basis. The training could be either an internal training by an SESC expert or external training.

3. Inspections and Record Keeping

Continuous

- Maintain records of site plan reviews and correspondence with permit applicants including phone logs, e-mails, and written correspondence.

C. SOP 530. Receive and Consider Complaints from the Public Regarding Construction Activities that Discharge Sediment-Laden Stormwater Runoff to the Storm Sewer or Combined Sewer Systems

1. Procedures/Practices

- Document any phone calls, e-mails, letters, or verbal complaints of information that are received from the public.
- Inquire into the complaint by visiting the construction site. Document the site visit and any observations and communications with the contractor.
- If there is a violation of the provisions of the City of Lansing ordinance (Lansing, Michigan, Code of Ordinances, Part 12 – Planning and Zoning Code, Title 2 – Planning, Chapter 1218 – Soil Erosion and Sedimentation Control), the process written in the ordinance will be followed to bring the work back into compliance.
- Refer to SOP 510 for notification to the MDEQ regarding the discharge.
- A courtesy follow-up communication should be made to the individual with the initial complaint.

2. Employee Training

Every 5 years

- Employees involved in construction site inspections, should be trained on proper SESC measures and how to record the appropriate information in the field.

3. Inspections and Record Keeping

Continuous

- Maintain records of complaints received and any follow-up work done to bring a construction site violation back into compliance with the permit per the City's SESC ordinance (Lansing, Michigan, Code of Ordinances, Part 12 – Planning and Zoning Code, Title 2 – Planning, Chapter 1218 – Soil Erosion and Sedimentation Control).

VI. SOP SERIES 600. PUBLIC EDUCATION

Purpose of SOP Series 600

Implementation of a Public Education Plan (PEP) is a minimum measure for compliance with the requirements of the City's current Phase II stormwater National Pollutant Discharge Elimination System (NPDES) permit authorization. With the goal of permit compliance, this SOP includes the procedures for continued implementation of the PEP, tracking implementation of the PEP, evaluating the impacts of specific PEP activities, and updating and periodically submitting the PEP to the MDEQ.

Related Guidance

- USEPA National Menu of BMPs
- USEPA Storm water Phase II Final Rule Fact Sheet Series
- USEPA Getting in Step <http://www.epa.gov/owow/watershed/outreach/documents/getnstep.pdf>

D. SOP 610. Public Education Plan

4. Procedures/Practices

Continuous

- Implement the specific activities of the City of Lansing PEP, which includes coordination with the Greater Lansing Regional Committee on Stormwater Management (GLRC).
- The City of Lansing Public Education Plan is located on the City's website at www.lansingstormwater.com.
- Track the implementation of the specific activities of the City of Lansing PEP using the ASIST database. Tracking may include description of City participation in school district festivals, number of watershed signs posted, and number of brochures/pamphlets distributed. Specific tracking (or measure of usage) information is noted in the PEP.

Every 2 to 5 years

- Evaluate the impacts of the specific activities of the City of Lansing Public Education Plan. Evaluation mechanisms may include a public awareness survey, City staff training survey, and a student awareness survey. Additional evaluation mechanism information is included in the PEP.
- Update the PEP to reflect required objectives and actions presented in the Stormwater Management Program and submit to the Assistant City Engineer. The Assistant City Engineer will ensure that the updated PEP is submitted to the MDEQ per the schedule in the NPDES permit.

- Following the update of the PEP, a City of Lansing staff member will input the applicable PEP activities into the ASIST database, so these activities can be tracked as progress is made with respect to NPDES permit compliance. Planned evaluation mechanisms as documented in the PEP must also be entered into ASIST.

5. Employee Training

As needed

- The employee(s) responsible for implementation of the PEP is to be trained on the implementation requirements.

6. Inspections and Record Keeping

Continuous

- Maintain up-to-date records of implementation of the PEP in the ASIST database. The recorded information will be useful in preparing required progress reports per the City's current Phase II Stormwater NPDES permit authorization.

VII. SOP SERIES 700. ILLICIT DISCHARGE ELIMINATION PROGRAM

Purpose of SOP Series 700

To obtain and record inventory information for new outfalls including construction material, size, Global Positioning System (GPS) location, and reporting the location of new outfalls to the MDEQ. To conduct field screening of Outfalls to schedule, report, track and enforce the illumination of illicit discharges including response to spills and emergency situations. To perform a round of dry-weather screening of city outfalls every 5 years and to track the effectiveness of the IDEP program. To track the cleaning, lining and rehabilitation of sanitary sewers and the disconnection of illicit discharges.

Related Guidance

- Center for Watershed Protection Illicit Discharge Detection and Elimination Manual.
- City of Lansing IDEP Field Protocol Manual.
- City of Lansing Quality Assurance Project Plan (QAPP)
- MDEQ NPDES Wastewater Discharge General Permit (2003)

Other Related SOPs

- EPA-430/9-74-004, Maintenance Management Systems for Municipal Wastewater Facilities

A. SOP 710. Field Screening and Inventory of Existing Outfalls

1. Procedures/Practices

Each Visit

- Perform a dry-weather screening of each outfall noting dry weather flow, pipe size and material, direction of pipe from manhole, depth of pipe invert relative to manhole rim (if applicable), date and time of inspection and GPS location within 1 meter. Note any visual indications of an illicit discharge. Use the IDEP Drainage System Inventory and Drainage System Screening forms that are included in the appendix.



Dry weather flow



Outfall sampling

- Take a digital photograph of the outfall pipe or manhole showing the structure and its immediate surroundings.

Immediately

- Conduct a follow-up, upstream investigation on any outfall that exhibits visual or physical signs of sewage contamination (Smell, sewage bacteria, sanitary debris).

As Soon as Practical

- Conduct a follow-up, upstream investigation on outfalls that fall outside of chemical testing parameters: Ammonia >1mg/L; Surfactant >0.2mg/L; E. coli >2000 colonies/100ml; Temperature > ambient air temperature; pH >9 or <6.3.

During Field Screening Process

- Watch for discharges from Sanitary Sewer Overflows (SSO) and non-point source discharges and record them on the IDEP Drainage System Inventory and Drainage System Screening that is included in the appendix.

If Dry Weather Flow Present

- Collect a sample of any dry weather flow. Test for Ammonia, Surfactant, E. coli, pH, and Temperature (see the City of Lansing IDEP Field Protocol Manual for sampling procedures).

Immediately

- Enter data from screening and inventory in the City of Lansing IDEP ASIST database.

Every 5 Years

- Conduct a field screening and inventory of all existing city outfalls. Outfalls should only be screened in dry weather (At least 72 hours after the last rainfall event that produced more than 0.1 inches of rainfall).

2. Employee Training

Annually

- Train field staff to identify and report suspected illicit discharges.
- Staff conducting field screening need to be trained on the use of the IDEP Drainage System Inventory and Drainage System Screening forms and procedures for performing dry weather screening, taking dry weather flow samples, conducting upstream investigations, and entering data into the IDEP ASIST database.

3. Inspections and Record Keeping

Continuous

- The IDEP Drainage System Inventory and Drainage System Screening Forms will be used for field screenings and upstream investigations. The information from the completed forms should be entered into the IDEP ASIST database for future reference and to aid in the process for removing illicit discharges from private properties.

B. SOP 720. Upstream Tracking and Discharge Verification

1. Procedures/Practices

Immediately

- Trace the suspected illicit discharge upstream through the storm sewer system, sampling any flowing input pipes along the way. Try to isolate any suspected illicit discharge to a single stretch of sewer or city block.
- Notify the owners of suspect properties by mail of the intention to dye test their property to confirm the presence or absence of an illicit discharge. Work with the property owner to set up a convenient time to conduct the dye testing.



Positive dye test

As Soon As Practical

- Dye test suspected illicit discharge sources (toilets, sinks, sump drains, floor drains, etc.) to isolate the source.

2. Employee Training

Annually

- Staff conducting upstream tracking need to be trained on the use of the IDEP Drainage System Inventory and Drainage System Screening Forms and procedures for tracking discharges upstream through the storm sewer system, taking dry weather flow samples, dye testing, working with the property owner of the suspected illicit discharge, and entering data into the IDEP ASIST database.

3. Inspections and Record Keeping

Continuous

- The IDEP Drainage System Inventory and Drainage System Screening Forms will be used for field screenings and upstream investigations. The information from the completed forms should be entered into the IDEP ASIST database for future reference and to aid in the process for removing illicit discharges from private properties. Correspondence with property owners should also be documented including phone calls, e-mails, letters, and verbal communication.

C. SOP 730. Reporting and Notification of Illicit Discharges

1. Procedures/Practices

A. O&M Division

If a discharge endangers health or the environment, report this information to the Wastewater Treatment Plant Superintendent as soon as possible and no later than within 12 hours from the time an illicit discharge is confirmed. The reported information must include:

- a description of the discharge and cause,
- the period of discharge, including exact dates and times; or, if not corrected, the anticipated time the discharge is expected to continue, and
- the steps taken to reduce, eliminate and prevent recurrence of the discharge.

B. Wastewater Division

Report the discharge to MDEQ in accordance with NPDES-required notification procedures and to Engineering Division when assistance in achieving elimination of the discharge is needed. MDEQ notification procedures include:

- Within 24 Hours – verbally report any noncompliance which may endanger health or the environment within 24 hours from the time the discharge is confirmed.
- Within 5 Days – a written report of noncompliance which may endanger health or the environment shall be provided to the MDEQ within 5 days from the time the discharge is confirmed. The reported information shall include:
 - a description of the discharge and cause of noncompliance
 - the period of discharge, including exact dates and times; or, if not corrected, the anticipated time the discharge is expected to continue, and
 - the steps taken to reduce, eliminate and prevent recurrence of the discharge.

In addition, when the discharge contains sanitary sewage, provide notification of the discharge to the Ingham County Health Department.



Outfall documentation



Sewage stain

2. Employee Training

At least once per year

- Employee training should include the procedure for notifying the MDEQ of illicit discharges to the City of Lansing's Municipal Separate Storm Sewer System.

3. Inspections and Record Keeping

Continuous

- Maintain up to date records regarding any illicit discharges discovered including phone logs, e-mails, and written correspondence. Document all relevant screening and sampling activities and correspondence with the property owner where the illicit discharge originates.

D. SOP 740. Field Screening and Inventory of New Outfalls

1. Procedures/Practices

As Soon As Practical

- Conduct a dry-weather screening and inventory of new outfalls created by the CSO project or other construction projects using the IDEP Drainage System Inventory and Drainage System Screening Forms.
- Perform a dry-weather screening for each new outfall noting dry weather flow, pipe size and material, direction of pipe from manhole, depth of pipe invert relative to manhole rim (if applicable), date and time of inspection and GPS location within 1 meter. Note any visual indications of an illicit discharge. Use the IDEP Drainage System Inventory and Drainage System Screening forms that are included in the appendix.

During Screening

- Take a digital photograph of the outfall pipe or manhole showing the structure and its immediate surroundings.

Immediately

- Enter data from screening and inventory in the City of Lansing IDEP ASIST database.

Annually

- Report new outfalls to MDEQ.

2. Employee Training

Annually

- Staff conducting field screening need to be trained on the use of the IDEP Drainage System Inventory and Drainage System Screening Forms and procedures for performing dry weather screening, taking dry weather flow samples, conducting upstream investigations, entering data into the IDEP ASIST database, and reporting new outfalls to MDEQ.

3. Inspections and Record Keeping

Continuous

- The IDEP Drainage System Inventory and Drainage System Screening Forms will be used for field screenings and upstream investigations. The information from the completed forms should be entered into the IDEP ASIST database for future

reference and to aid in the process for removing illicit discharges from private properties.

E. SOP 750. Internal Tracking and Reporting

1. Procedures/Practices

Directly After Screening

- Document the date, time, and screening results of existing outfalls as they are visited.
Enter these results in the IDEP ASIST database.

As Work is Completed

- Track the location and resolution of all illicit discharges in the IDEP database.
Document upstream follow- up investigations including results for any dye testing or sewer televising work.

2. Employee Training

Annually

- Train Staff on the use of the IDEP ASIST database and the IDEP Drainage System Inventory and Drainage System Screening Forms.

3. Inspections and Record Keeping

Continuous

- The IDEP Drainage System Inventory and Drainage System Screening Forms will be used for field screenings and upstream investigations. The information from the completed forms should be entered into the IDEP ASIST database for future reference and to aid in the process for removing illicit discharges from private properties.

F. SOP 760. Emergency Spill Response

1. Procedures/Practices

Immediately

- In the event the spill or release poses a threat to public safety, call 9-1-1 immediately.
- Report spills or accidental releases immediately to the MDEQ Pollution Emergency Alerting System (PEAS) 24-hour hotline at 1-800-292-4706.



Emergency response to large illicit discharge

- If not a threat to public safety, determine the best approach and schedule to clean up and address the spill in coordination with the MDEQ. This may mean coordinating with entities downstream to try to capture the spill if it has reached a water body. If this is a hazardous release, only trained professionals will be involved in the actual clean-up.
- If spill substance is unknown, do not try to clean it up without hazardous material professionals.
- Consider the measures to be taken to prevent future releases of a similar nature and implement any changes to procedures or equipment.

Within 10 Days

- Within 10 days of the spill or release, submit to the MDEQ a full written explanation as to the cause, discovery, response (clean-up and/or recovery) measures taken, and preventative measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

2. Employee Training

Annually

- Train staff on the emergency spill response procedure.

3. Inspections and Record Keeping

Continuous

- Document all correspondence related to the spill including phone calls, e-mails, letters, and verbal communication.
- Follow through with frequent inspections of the spill site, if safe, until the spill is cleaned up.

G. SOP 770. Sewer System Improvements and Maintenance Tracking

1. Procedures/Practices

Daily

- For sewer maintenance work, Work Order Forms are completed and given to the person assigned to do the maintenance work.
- Tracking of cleaning is done on a base map showing sewer lines and catch basins that remain to be cleaned. As each element is cleaned, that line or element is yellowed out with a marker.

Upon Completion

- When work is completed, the carbon copies of the completed Work Order and Work Record form are filed; the Work Order part is filed in chronological order. The Work Record is filed in the folder for the particular sewer element /segment where the work was done.

Continuous

- Establish and follow a routine maintenance and inspection schedule keeping data and records for each element. Place special emphasis on documenting unusual incidents or faulty operating conditions.

2. Employee Training

Annually

- Train applicable staff on proper sewer system improvement and maintenance tracking procedures.

3. Inspections and Record Keeping

Continuous

- Maintaining records of system maintenance, structure location, and construction changes is the responsibility of each City employee working on the system. A maintenance record will contain, integrate and maintain information on the City's sewer system.

VIII. SOP SERIES 800. MANAGING VEGETATED PROPERTIES

Purpose of SOP Series 800

To protect storm water by properly storing, handling and applying pesticides, herbicides and fertilizers to city-owned vegetated properties. To follow manufacturer's specifications and applicable regulations to minimize or prevent the discharge of pesticides, herbicides and fertilizers into rivers, streams or lakes.

Related Guidance

- USEPA National Menu of BMPs
- USEPA Stormwater Phase II Final Rule Fact Sheet Series
- MDEQ Guidebook of BMPs:
 - Equipment Maintenance and Storage Areas
 - Fertilizer Management
 - Pesticide Management
 - Buffer/Filter Strips
 - Critical Area Stabilization
 - Hydroseeding
 - Organic Debris Disposal
 - Seeding
 - Soil Management
 - Sodding
 - Slope/Shoreline Stabilization
 - Lawn Maintenance
 - Grassed Waterway
 - Household Hazardous Waste Disposal

Other Related SOPs

- Control of Solids and Contaminants from City's Paved Surfaces
- Pollution Prevention for Fleet Maintenance and Storage Yards

A. SOP 810. Proper Storage of Pesticides, Herbicides and Fertilizers

1. Procedures/Practices

Continuous

- Use proper containers for storing chemicals.



Liquid pesticide and fertilizer storage tanks

Photo Source: www.croplife.com.

- Keep Material Safety Data Sheets (MSDS) near chemical storage areas.
- Store pesticides, herbicides and fertilizers in a covered container off the floor in a dry location according to manufacturer's specifications. Never store pesticides, herbicides or fertilizers near storm drains or waterbodies.



Indoor dry fertilizer storage

Photo Source: MBC Building and Excavating.

- Clearly label containers.
- Order only the amount needed to prevent surplus or expired chemicals. Order chemicals just prior to usage to reduce storage time.
- Follow all applicable federal and state regulations for storing pesticides, herbicides and fertilizers.

Weekly

- Inspect storage areas for leaks and spills.

Annually

- Check expiration dates and dispose of expired product in accordance with the manufacturer's specifications.

2. Employee Training

Annually

- All employees who handle or apply pesticides, herbicides and fertilizers should be trained on MSDS for each chemical.
- Train all employees on the Stormwater Pollution Prevention & Spill Response Plan to know how to properly clean up spills.

As Needed

- All employees who handle or apply pesticides and herbicides must be certified through the Michigan Department of Agriculture and Rural Development Pesticide Application Certification program.

3. Inspections and Record Keeping

Continuous

- Keep an up-to-date inventory of all pesticides, herbicides and fertilizers stored. The list should include the name of the product, the manufacturer, the number of bags/containers and expiration date.
- Compile a binder of all MSDS for pesticide, herbicides and fertilizers and have a general location to store it.
- Keep an up-to-date list of all Certified Pesticide Applicators.
- Keep an up-to-date list of pesticides, herbicides and fertilizers being applied. The list should include the name of the product, employee who applied the product, date of application, amount applied and location.
- Keep an up-to-date list of the amount of trash collected. The list should include the collection date, location of collection, and the number of trash bags filled.
- Keep an up-to-date soil testing tracking form. The form should include the date of testing, location tested, employee, and results of the soil test.

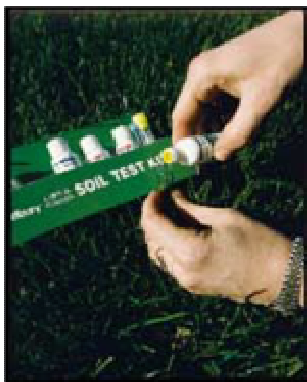
B. SOP 820. Proper Handling, Mixing, and Application of Pesticides, Herbicides and Fertilizers

1. Procedures/Practices

Continuous

- Only a Certified Pesticide Applicator may apply pesticides or herbicides.
- Use proper Personal Protection Equipment (PPE) when handling and applying chemicals.
- All employees handling, mixing and applying pesticides, herbicides and fertilizers should be trained on the use of MSDS.
- Mix only enough chemical for immediate use.
- Follow manufacturer's recommendations for handling, mixing and applying chemicals.
- Follow all federal and state regulations when handling, mixing and applying pesticides, herbicides and fertilizers.
- Mix pesticides, herbicides and fertilizers in designated areas and away from storm drains or water bodies.
- Employees applying pesticides, herbicides and fertilizers should read the MSDS for each product they use.
- Calibrate application equipment to ensure proper amount of product is applied.
- Use caution when broadcasting product near a waterway or storm drain structure.
- If fertilizer is broadcast or spilled on a sidewalk, street or driveway, sweep up the excess and dispose of properly.
- Promptly cleanup any spills or leakage. Use dry absorbent for liquids and sweep up solid product. Properly dispose of waste.
- Use fertilizers with no phosphorous content.
- Pesticide application equipment should have an emergency shut-off switch.
- Use the least toxic product or method available to do the job.
- Use biodegradable products when available.
- Spot treat problem areas with pesticides rather than treating larger areas.
- Avoid broadcast spraying of pesticides or herbicides.
- Use the granular form of fertilizers, herbicides and pesticides to minimize application losses. If using liquids, be aware of wind direction to avoid wind drift of chemicals.
- Use a designated wash station to wash equipment.

- Apply products only when grounds is not frozen.
Monthly (Spring and Fall)
- Test soil before applying fertilizer.



Soil test kit

Photo courtesy of USDA-NRCS.

Seasonal

- Apply fertilizer during the fall or spring for maximum plant uptake.

As Needed

- Use pesticides or herbicides only as needed, per soil testing results. Do not overuse.

2. Employee Training

Annually

- All employees who handle or apply pesticides, herbicides and fertilizers should be trained on MSDS for each chemical.
- Train all employees on the Stormwater Pollution Prevention & Spill Response Plan to know how to properly clean up spills.

As Needed

- All employees who handle or apply pesticides and herbicides must be certified through the Michigan Department of Agriculture and Rural Development Pesticide Application Certification program.

3. Inspections and Record Keeping

Continuous

- Keep an up-to-date inventory of all pesticides, herbicides and fertilizers stored. The list should include the name of the product, the manufacturer, the number of bags/containers and expiration date.
- Compile a binder of all MSDS for pesticide, herbicides and fertilizers and have a general location to store it.

- Keep an up-to-date list of all Certified Pesticide Applicators.
- Keep an up-to-date list of pesticides, herbicides and fertilizers being applied. The list should include the name of the product, employee who applied the product, date of application, amount applied and location.
- Keep an up-to-date list of the amount of trash collected. The list should include the collection date, location of collection, and the number of trash bags filled.
- Keep an up-to-date soil testing tracking form. The form should include the date of testing, location tested, employee, and results of the soil test.

C. SOP 830. Maintaining Riparian Areas

1. Procedures/Practices

Continuous

- Maintain at least a 10-foot, non-mowed buffer around water bodies if possible.
- Plant native plants that are adapted to local conditions.
- Avoid applying herbicides or pesticides within buffer. Remove undesirable plants by hand instead.
- To prevent erosion, repair damage to the buffer strip as soon as possible by replanting or fixing upslope areas.
- Use the proper PPE for picking up trash and debris.
- Properly dispose of trash or recycle if possible.

Annually

- All employees who handle or apply pesticides, herbicides and fertilizers should be trained on MSDS for each chemical.
- Train all employees on the Stormwater Pollution Prevention & Spill Response Plan to know how to properly clean up spills.

Twice a Year

- Clean up trash or debris in early spring after snow melt and late fall at a minimum.

As Needed

- All employees who handle or apply pesticides and herbicides must be certified through the Michigan Department of Agriculture and Rural Development Pesticide Application Certification program.

2. Employee Training

Annually

- All employees who handle or apply pesticides, herbicides and fertilizers should be trained on MSDS for each chemical.
- Train all employees on the Stormwater Pollution Prevention & Spill Response Plan to know how to properly clean up spills.

As Needed

- All employees who handle or apply pesticides and herbicides must be certified through the Michigan Department of Agriculture and Rural Development Pesticide Application Certification program.

3. Inspections and Record Keeping

Continuous

- Keep an up-to-date inventory of all pesticides, herbicides and fertilizers stored. The list should include the name of the product, the manufacturer, the number of bags/containers and expiration date.
- Compile a binder of all MSDS for pesticide, herbicides and fertilizers and have a general location to store it.
- Keep an up-to-date list of all Certified Pesticide Applicators.
- Keep an up-to-date list of pesticides, herbicides and fertilizers being applied. The list should include the name of the product, employee who applied the product, date of application, amount applied and location.
- Keep an up-to-date list of the amount of trash collected. The list should include the collection date, location of collection, and the number of trash bags filled.
- Keep an up-to-date soil testing tracking form. The form should include the date of testing, location tested, employee, and results of the soil test.

APPENDIX A - SOP 100 FORMS

MUNICIPAL MAINTENANCE YARD INSPECTION CHECKLIST

Date/Time:

Site Name and Location:

Description of Activities:

Receiving Water Body:

Vehicle and Equipment Storage and Maintenance		Comments
	Are vehicle maintenance activities conducted in a designated place not exposed to storm water?	
	Are chemicals and wastes stored and disposed of properly without any evidence of a spill?	
	If hazardous waste materials are generated on site, are they labeled and are there tracking records of the recycling/disposal?	
	Is the facility free of litter, waste materials, and scrap equipment?	
	Are leaking vehicles or equipment stored indoors or are fluids drained?	
	Do stored liquids (fuels, oils, etc) have secondary containment?	
	Is liquid waste disposed of properly and not being poured into storm system or sink/sanitary sewer?	
	Are drip pans being used during maintenance of vehicles? Are they being cleaned and stored properly when not in use?	
	Are the floor drains discharging into a storage sump with an oil/water separator before discharge to the sanitary sewer?	

Vehicle and Equipment Washing Areas		Comments
	Are vehicles washed on-site? Is wash water discharged to the storm sewer system or sanitary sewer?	
	Is there a designated area for cleaning activities located away from storm sewers?	
	Are wash waters contained and recycled, and sumps cleaned and maintained properly?	
	Are there containment structures surrounding outdoor wash areas?	
	Are detergents being used for cleaning? If so, are preventive measures taken to avoid discharge to the storm sewer system?	
	Have employees been trained on proper washing procedures?	

Vehicle and Equipment Fueling Areas		Comments
	Are fueling stations properly designed with spill kits nearby?	
	Are signs posted to inform employees of proper fueling procedures?	

Vehicle and Equipment Fueling Areas		Comments
	Are storm drains covered during fuel loading/transfer?	
	Are overfill protection devices installed on tanks?	
	Is fueling equipment maintained properly and in good working condition?	
	Are dry cleanup methods being implemented for spills and leaks? Are absorbent materials cleaned up and disposed of promptly and properly?	
	Is the fueling area and equipment inspected and kept clean of spills, debris and other polluting materials?	
	Does the fueling pad discharge into a storage sump and not into a storm sewer system?	

Outdoor Storage (Container)		Comments
	Are all materials that are potential storm water contaminants stored under a cover or in secondary containment?	
	Are all containers and dumpsters properly labeled and materials kept separate?	
	Is the ground free of visual stains from oil or other fluids?	
	Are storage area covered and maintained properly?	

Salt Storage		Comments
	Are all materials that are potential storm water contaminants stored under a cover or in secondary containment?	
	Is the loading/unloading area swept regularly?	

General Pollution Prevention/Good Housekeeping Procedures		Comments
	Are storm drains labeled and free of debris?	
	Are stock piles maintained properly to prevent runoff and pollutants from entering the storm system?	
	Is regular street sweeping of the facility done to control litter?	

Inspections, Record Keeping and Employee Training		Comments
	Has the facility developed a SWPPP? Is the plan updated regularly and filed on-site?	
	Does the SWPPP include a site map, list of pollutant sources, BMPs, and maintenance procedures?	
	Are new and current employees trained on storm water procedures and spill response? Are employee training records on file?	
	Does the City conduct and document periodic inspections of the facility?	
	Is an Emergency Response Plan on site? Are employees trained on emergency procedures?	

MUNICIPAL STRUCTURAL STORMWATER CONTROL INSPECTION CHECKLIST

Date/Time:

Site Name and Location:

Description of Activities:

Receiving Water Body:

Structure Type (Circle one): Dry Detention Basin Wet Pond Rain Garden

Inspectors:

SEDIMENT DEPTH MEASUREMENT IN POND

	<input type="checkbox"/> NEEDS IMMEDIATE ATTENTION:
WATER DEPTH TO TOP OF SEDIMENT:	FOR SEDIMENT FOREBAY: DOES SEDIMENT EXCEED 25% of FOREBAY OR IS WITHIN 1 FOOT OF THE WATER SURFACE? <input type="checkbox"/> YES <input type="checkbox"/> NO
WATER DEPTH TO BOTTOM OF SEDIMENT:	FOR DEEP POOL: IS SEDIMENT WITHIN 1 FOOT OF THE OUTLET? <input type="checkbox"/> YES <input type="checkbox"/> NO IS SEDIMENT HAZARDOUS? <input type="checkbox"/> YES <input type="checkbox"/> NO

INLET AND CHANNEL 1

SIZE:	<input type="checkbox"/> NEEDS IMMEDIATE ATTENTION:
MATERIAL:	DRAINS FROM (Direction):
PHOTO #:	
<p>MARK THOSE CONDITIONS THAT ARE PRESENT:</p> <p><input type="checkbox"/> ENERGY DISSIPATION (RIP RAP OR OTHER)</p> <p><input type="checkbox"/> EROSION</p> <p><input type="checkbox"/> TRASH</p> <p><input type="checkbox"/> PEST DAMAGE</p> <p><input type="checkbox"/> SEDIMENT BUILDUP</p> <p><input type="checkbox"/> EXCESSIVE VEGETATION</p> <p><input type="checkbox"/> UNIDENTIFIED OR HAZARDOUS WASTE</p> <p>COMMENTS:</p>	

INLET AND CHANNEL 2 ☐ DOES NOT EXIST

SIZE:	<input type="checkbox"/> NEEDS IMMEDIATE ATTENTION:
MATERIAL:	DRAINS FROM (Direction):
PHOTO #:	
<p>MARK THOSE CONDITIONS THAT ARE PRESENT:</p> <p><input type="checkbox"/> ENERGY DISSIPATION (RIP RAP OR OTHER) <input type="checkbox"/> EROSION <input type="checkbox"/> TRASH <input type="checkbox"/> PEST DAMAGE <input type="checkbox"/> SEDIMENT BUILDUP <input type="checkbox"/> EXCESSIVE VEGETATION <input type="checkbox"/> UNIDENTIFIED OR HAZARDOUS WASTE</p> <p>COMMENTS:</p>	

INLET AND CHANNEL 3 ☐ DOES NOT EXIST

SIZE:	<input type="checkbox"/> NEEDS IMMEDIATE ATTENTION:
MATERIAL:	DRAINS FROM (Direction):
PHOTO #:	
<p>MARK THOSE CONDITIONS THAT ARE PRESENT:</p> <p><input type="checkbox"/> ENERGY DISSIPATION (RIP RAP OR OTHER) <input type="checkbox"/> EROSION <input type="checkbox"/> TRASH <input type="checkbox"/> PEST DAMAGE <input type="checkbox"/> SEDIMENT BUILDUP <input type="checkbox"/> EXCESSIVE VEGETATION <input type="checkbox"/> UNIDENTIFIED OR HAZARDOUS WASTE</p> <p>COMMENTS:</p>	

OUTLET 1 ☐ NO STRUCTURE - INFILTRATION ONLY

SIZE:	<input type="checkbox"/> NEEDS IMMEDIATE ATTENTION:
MATERIAL:	DRAINS TO (Direction):
PHOTO #:	
<p>MARK THOSE CONDITIONS THAT ARE PRESENT:</p> <p><input type="checkbox"/> TRASH RACK OR OTHER PROTECTION <input type="checkbox"/> EROSION <input type="checkbox"/> TRASH <input type="checkbox"/> PEST DAMAGE <input type="checkbox"/> SEDIMENT BUILDUP <input type="checkbox"/> EXCESSIVE VEGETATION <input type="checkbox"/> UNIDENTIFIED OR HAZARDOUS WASTE</p> <p>COMMENTS:</p>	

FENCING ☐ DOES NOT EXIST

HEIGHT:	<input type="checkbox"/> NEEDS IMMEDIATE ATTENTION:
MATERIAL:	
PHOTO #:	
<p>MARK THOSE CONDITIONS THAT ARE PRESENT:</p> <p><input type="checkbox"/> BREACH <input type="checkbox"/> EROSION <input type="checkbox"/> TRASH <input type="checkbox"/> PEST DAMAGE <input type="checkbox"/> EXCESSIVE VEGETATION <input type="checkbox"/> UNIDENTIFIED OR HAZARDOUS WASTE</p> <p>COMMENTS:</p>	

BANKS ☐ DOES NOT EXIST

MATERIAL:	<input type="checkbox"/> NEEDS IMMEDIATE ATTENTION:
PHOTO #:	
<p>MARK THOSE CONDITIONS THAT ARE PRESENT:</p> <p><input type="checkbox"/> EROSION <input type="checkbox"/> TRASH <input type="checkbox"/> PEST DAMAGE <input type="checkbox"/> PHRAGMITES <input type="checkbox"/> UNIDENTIFIED OR HAZARDOUS WASTE</p> <p>COMMENTS:</p>	

EMBANKMENT/DAM ☐ DOES NOT EXIST

MATERIAL:	<input type="checkbox"/> NEEDS IMMEDIATE ATTENTION:
PHOTO #:	
<p>MARK THOSE CONDITIONS THAT ARE PRESENT:</p> <p><input type="checkbox"/> EROSION <input type="checkbox"/> TRASH <input type="checkbox"/> PEST DAMAGE <input type="checkbox"/> PHRAGMITES <input type="checkbox"/> WOODY VEGETATION <input type="checkbox"/> UNIDENTIFIED OR HAZARDOUS WASTE</p> <p>COMMENTS:</p>	

POND WATER ☐ DOES NOT EXIST

DEPTH:	<input type="checkbox"/> NEEDS IMMEDIATE ATTENTION:
PHOTO #:	
<p>MARK THOSE CONDITIONS THAT ARE PRESENT:</p> <ul style="list-style-type: none"><input type="checkbox"/> ALGAE - MINIMAL<input type="checkbox"/> ALGAE – COVERING POND<input type="checkbox"/> CLOUDY<input type="checkbox"/> OILY SHEEN<input type="checkbox"/> FOUL ODOR<input type="checkbox"/> TRASH<input type="checkbox"/> PHRAGMITES<input type="checkbox"/> UNIDENTIFIED OR HAZARDOUS WASTE <p>COMMENTS:</p>	

PLANTED VEGETATION (FOR RAIN GARDENS) ☐ DOES NOT EXIST

PHOTO #:	<input type="checkbox"/> NEEDS IMMEDIATE ATTENTION:
<p>MARK THOSE CONDITIONS THAT ARE PRESENT:</p> <ul style="list-style-type: none"><input type="checkbox"/> VIGOROUS GROWTH<input type="checkbox"/> POOR GROWTH<input type="checkbox"/> DISEASED<input type="checkbox"/> WEEDY<input type="checkbox"/> TRASH<input type="checkbox"/> EXCESS MULCH<input type="checkbox"/> LACK OF MULCH<input type="checkbox"/> UNIDENTIFIED OR HAZARDOUS WASTE <p>COMMENTS:</p>	

APPENDIX B - SOP 300 FORMS

CATCH BASIN CLEANING FORM

Date/Time:

Precipitation in the last three days? No Yes

Supervisor/Crew Leader:

[illegible]

APPENDIX C – SOP 700 FORMS

DRAINAGE SYSTEM INVENTORY

GENERAL

ID _____

Date _____

Time _____

Initial (1) _____

Initial (2) _____

Picture #'s _____

STRUCTURE TYPE

☐ Discharging Pipe

☐ Not Found

☐ Manhole

☐ Blind Tie or Tap

☐ Catch Basin

☐ Non-point Source (circle below)

☐ Culvert Outlet

*Seepage

☐ Point in Open Channel

*Overland flow

OWNERSHIP

☐ City of Lansing

☐ ICRC

☐ ICDC

☐ Other

☐ Private

☐ Unknown

LOCATION (see back side for location sketch)

Latitude _____

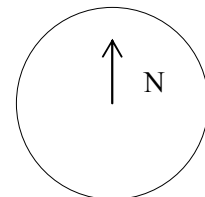
Longitude _____

Offset Description _____

Receiving Waterbody: _____

Inventory Comments: _____

CONDUIT INFORMATION						
Pipe ID						
Direction from MH						
Shape						
Diameter (in)						
Width (in) (Open Channel)						
Depth (in)						
Measure Down (ft) (Manhole)						
Invert Elevation (ft) (Pipes)						
Conduit Material						
Inlet/Outlet						



Canine hit: ☐ Yes ☐ No

LOCATION SKETCH

LOCATION SKETCH CHECKLIST

- ☐ Label street names
- ☐ Indicate north
- ☐ Locate manholes by dimensions from property lines, back of curb, or edge of pavement
- ☐ Sketch catch basins and connections (no measurements necessary)
- ☐ Indicate (if possible) distance to upstream and downstream manholes
- ☐ Flow direction
- ☐ Sample point
- ☐ Special access/traffic control notes
- ☐ Between mile markers ____ & ____ or ____ tenths past mile marker ____
- ☐ Velocity/depth measure location

DRAINAGE SYSTEM SCREENING

GENERAL

Date _____ Time _____ Air Temp _____ ID _____
Initials _____ Chk By _____ Rain ☐ Yes ☐ Clear/Sunny
☐ No ☐ Partly Cloudy
☐ Overcast

DRY WEATHER FLOW PRESENT

- ☐ Yes, dry weather flow present
☐ Trace, insufficient flow to sample
☐ No dry weather flow present
☐ Standing water
☐ Submerged
☐ Inundated
☐ N/A

FLOW MEASUREMENTS

Pipe Sampled: _____ Size (in) _____ Direction _____
Method: ☐ Area * Velocity

General Data	Travel Time Trials
Depth (in) _____	#1 (sec) _____
Dist Traveled (ft) _____	#2 (sec) _____
Bucket Vol (l) _____	#3 (sec) _____
Channel slope (%) _____	Avg (sec) _____
Channel material _____	Vel (fps) _____
Channel, n _____	

Flow: _____

- Intermittent ☐ Not checked
Flow Check ☐ Left sand bag in channel
☐ Removed sand bag, intermittent DWF present ☐ Yes ☐ No

If possible, describe frequency, duration, time of day of flow slugs—put in comments section.

DISCHARGE OBSERVATIONS (if "other" checked, fill in description at bottom of page)

Odor	Floatables	Deposits/Stains	Vegetation	Structural
<input type="checkbox"/> None	<input type="checkbox"/> None	<input type="checkbox"/> None	<input type="checkbox"/> None	<input type="checkbox"/> Normal
<input type="checkbox"/> Musty	<input type="checkbox"/> Trash	<input type="checkbox"/> Mineral	<input type="checkbox"/> Normal	<input type="checkbox"/> Cracking
<input type="checkbox"/> Sewage	<input type="checkbox"/> Sewage	<input type="checkbox"/> Sediment	<input type="checkbox"/> Excessive	<input type="checkbox"/> Spalling
<input type="checkbox"/> Rotten Egg	<input type="checkbox"/> Bacterial Sheen	<input type="checkbox"/> Oily	<input type="checkbox"/> Algae	<input type="checkbox"/> Corrosion
<input type="checkbox"/> Gas	<input type="checkbox"/> Oil Sheen	<input type="checkbox"/> Grease	<input type="checkbox"/> Slime	<input type="checkbox"/> Settlement
<input type="checkbox"/> Oil	<input type="checkbox"/> Suds	<input type="checkbox"/> Suds		<input type="checkbox"/> Staining
<input type="checkbox"/> Other	<input type="checkbox"/> Other	<input type="checkbox"/> Other	<input type="checkbox"/> Other	<input type="checkbox"/> Other

Description:

CHEMICAL ANALYSIS

FIELD ANALYSIS

Surfactants	_____	mg/L
Ammonia	_____	mg/L
Hardness	_____	mg/L
Fluoride	_____	mg/L
E. coli	_____	per 100 ml

LAB SAMPLE COLLECTED ID

Temperature	_____
pH	_____
Specific cond.	_____

RESULTS

- ☐ Illicit connection ruled out
- ☐ Illicit connection (undocumented connection)
- ☐ Pending
- ☐ Notify MDEQ
- ☐ Not a PSD

ACTION

- ☐ None required
- ☐ Illicit removed
- ☐ Waiting on lab results
- ☐ Dye test
- ☐ Televis
- ☐ Investigate further
- ☐ Illicit connection

Comments:
